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A

PLAN FOR IMPROVING
THE
EFFECTIVENESS AND UTILIZATION
OF
THE NAVY'S IN-HOUSE LABORATORIES

Prepared by
The Director of Navy Laboratories

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DEPARTMENT OF THE NAVY
DIRECTOR OF NAVY LABORATORIES
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25 MAY 1971

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MEMORANDUM FOR DISTRIBUTION LIST

Subj: DOD In-House Laboratory Review

Encl: (1) Draft Navy Plan for Improving its In-House Laboratories
with Appendices I and II

As you know, SECDEF and DDR&E have initiated studies of our In-House Labs, T&E facilities, and FCRC's. I have been the Navy representative on the In-House Lab Study Steering Group and also elected to draw up the Navy "Plan" essentially unilaterally. I did the latter partly because most of "my guys" were busy on the other two studies, and partly because as far as I can see, most of the detailed problems are being adequately addressed by one of the Task Forces which is re-looking at the "42 Problems" area.

Now that I have gotten such a plan (a "phased five-year plan for improving our laboratories and our utilization of them") down on paper, I think it's about time to cut you all in on it. We are supposed to send in our final version about 15 June, so if you have any major disagreements, now is the time to let me know. I doubt that much of this comes as a shock to any of you. Much of it is the result of conversations we have had in small or large groups in the past.

You will find that Appendix II is the real meat of the study - and may or may not reflect your view of the world. In reading it, recall that it is written in a general sense and that I freely admit that there are outstanding exceptions to nearly everything it says. However, on the whole, I believe it's a fair representation. In addition, it may give all of you some ideas about things you might do at your own activities to strengthen our overall position.

I will be looking forward to hearing from you if you have any comments.

Joel S. Lawson Jr.
JOEL S. LAWSON, JR.

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In response to requests from SECDEF and DDR&E, the Navy has prepared the following plan for the improvement of the utilization and effectiveness of its in-house Research and Development Centers and Laboratories . This plan encompasses specifically those organizations listed in Appendix 1, and will be accomplished as expeditiously as possible, although the continuing nature of many of its elements should be recognized.

As background to the present study and the plan which evolves from it, it will be recalled that a continuing evaluation of the Navy R&D complex has been underway since 1966. This has included the formation of the following "Centers of Excellence":

- Naval Air Development Center

- Naval Weapons Center

- Naval Ship Research and Development Center

- Naval Underwater Systems Center

- Naval Undersea Research and Development Center

- Naval Electronics Laboratory Center

In addition, there has been further focusing of the missions of:

- Naval Ordnance Laboratory

- Naval Weapons Laboratory

- Naval Civil Engineering Laboratory

And we have closed and disbanded:

- Naval Applied Science Laboratory, Brooklyn on 1 July 1969

- Naval Radiological Defense Laboratory on 1 November 1969

- Naval Ordnance Laboratory, Corona on 1 July 1971

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as well as making minor changes in the functions of some of the other Navy Laboratories and Centers.

Therefore, it is the objective of this plan not to seek more closures or major consolidations but to complete and strengthen the processes now underway.

Obviously, the first step in the development of such a plan is to formulate a clear statement of why we want to have such organizations, and what we expect them to do. Only with this in hand can we address the question of evaluating them and their performance preparatory to planning for their improvement. (It should be noted in passing that the evaluations and recommendations offered by the Blue Ribbon Panel were apparently based largely on hearsay without regard to the purposes for which the Laboratories are maintained, nor their performance of their assigned tasks. To our knowledge, none of the Panel or their staff visited any of the Navy Laboratories nor any of the officials in Headquarters responsible for their operation.)

Before the preparation of this plan was undertaken, the pertinent directives and policy statements were reviewed to establish the *raison d'etre* of the laboratories. Such directives and statements as were found were either incomplete or outdated or both. Subsequent research and discussions with senior Navy Department officials concerned with the RDT&E program elicited a more complete and current understanding of why we have the Laboratories and Centers and what they are supposed to do. In fact, there seems to be general agreement on these points, with some variation in emphasis, even though no definitive "policy" exists.

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In the review and evaluation of the performance and utilization of the Laboratories and Centers, it appeared that some of their problems stemmed from this lack of clearly stated objectives for their existence, guidance for their use by "customers", and direction for their internal development.

A summary report of this evaluation is included as Appendix 2. It intentionally addresses only the major strengths and weakness in the firm belief that the host of minor administrative actions will take place almost automatically if the underlying key problems can be identified and resolved.

The specific and detailed plan, included as Appendix 3, is summarized below. The specific problems or deficiencies are listed (without proof or discussion) followed by the action taken, planned, or proposed, to alleviate or solve the problem with its expected date of accomplishment.

PROBLEM 1. Lack of clarity and general understanding of the roles of the in-house laboratories and the work they are supposed to perform.

A. Rewrite and reissue SECNAVINST 3900.13A, which is the basic policy document on management of Navy research and development laboratories, to include appropriate, clear definitions of the roles of the in-house laboratories. (July 1, 1971)

B. Review lower level policy documents and instructions to ensure conformance with new 3900.13B. (Nov 1, 1971)

PROBLEM 2. Lack of clarity of the technical/systems areas for which each laboratory or center has the primary responsibility, leading to some overlap and duplication of effort and facilities.

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A. Review the mission statements of each laboratory (issued by CNO) and revise and reissue where necessary. (July 1, 1971)

B. Review the functional statements of each laboratory (issued by CNM and a more detailed assignment of tasks to be performed in carrying out the assigned mission) and revise and reissue where necessary. (Aug 1, 1971)

C. Review the workload and programs assigned to each laboratory to assure compatibility with their assigned functions and areas of responsibility. (Commence with FY 72 Apportionment and continuing indefinitely.)

PROBLEM 3. Lack of capability and effectiveness in the area of warfare analysis - specifically too little interaction with the intelligence community, too little involvement in the tactical side of Fleet Exercises, and over-emphasis on systems analysis at the expense of operations research.

A. Provide for direct liaison between the appropriate Laboratories/ Centers and the Naval Scientific and Technical Intelligence Center. (Program started March 1970. It will be further emphasized and encouraged.)

B. Provide a funded program to involve laboratory personnel in the planning, conduct, and evaluation of appropriate fleet exercises. (First efforts initiated in January 1971 on trial basis in ASW area have been successful. Seek funds in FY 73 budget to broaden program.)

C. Encourage Laboratory management to strengthen their operations research capability and seek Fleet support for work on real Fleet problems at the individual ship or squadron level as OEG tends to devote its attention to the Task Force or Fleet level. (Continuing)

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PROBLEM 4. Conflict between sponsors of "established" and funded programs and new or innovative ideas being sponsored by the laboratories, leading to a "don't rock the boat" atmosphere. This problem is partially due to the extreme difficulty of providing enough rationale and justification to get projects into the budget and is also related to problem 5.

A. Seek to persuade DDR&E/OSD to reduce the formal documentation requirements for at least part of the 6.3 program. (Commence 1 July 1971 - completion not under Navy control.)

B. Increase Navy efforts to support cheaper demonstration or feasibility prototypes as intermediate evaluation models of suitable equipment. (Program initiated by the CNO on 6 Feb 1971 based on his experience with VLAP program. Increased emphasis will be placed on this commencing with FY 72.)

PROBLEM 5. Insufficient funds under the direct control of the Technical Directors to enable them to investigate new ideas promptly.

A. Provide increased Independent Exploratory Development funds to the Director of Navy Laboratories to use for this purpose. (Efforts commenced unsuccessfully with FY 70 budget. Some progress made in FY 72 and plan is to assign 10% of the total 6.2 program to this effort by FY 76.)

B. Initiate a similar program for Independent Advanced Development to be used for "lash-up" systems models vice technology and components. (Initiate in FY 73 Budget)

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PROBLEM 6. Although progress has been made since the "42 problems" report, there is still room for improvement in our personnel administration and in the opportunities available to Laboratory personnel for professional development.

A. Urge the Laboratories and Centers to participate in the President's Executive Interchange Program. We are about to receive one "Interchange" from industry. During the next year we hope to place at least two civil servants on loan to industry.

B. Upgrade the "status" of appropriate Laboratories and Centers for the military personnel by having them placed on the "Major Command List." (Nearly complete, seven out of the ten major "hardware labs" are now being considered for such listing.)

C. Establish a Visiting Scientist program between Navy laboratories and with the laboratories of the other Services (Commence 1 Sept. 1971).

D. Continue participation in Project REFLEX and seek to extend it to all Laboratories. (This has been at least partially accomplished for FY 72 under OMB/DOD trial program to abolish numerical ceilings - Guidance letter signed 14 May 1971)

E. Delegate control over grades below super-grade/PL 313 to the local laboratory management. (Complete for CNM/ONR. Guidance will be issued to other commands prior to 1 Aug 1971)

PROBLEM 7. Lack of full utilization of talent and expertise in the laboratories, and the lack of enough challenging assignments to fully stimulate and motivate their people.

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A. Assign project managership of CAPTOR program through development phases to Naval Ordnance Laboratory (25 March 1971).

B. Assign project managership of AGILE, through development phases to NWC. (1 June 1971)

C. Increase laboratory participation in -

- | | | |
|--------------------------------------|---|------------------------|
| 1. program formulation (6.2) |) | |
| |) | |
| 2. proposal review and evaluation |) | All continuing efforts |
| |) | now underway |
| 3. source selection activities |) | |
| |) | |
| 4. advisory functions to CNO and CMC |) | |

D. Assign major responsibilities for appropriate portions of major weapons development programs to laboratories. (A systems integration role for the Mid-70 submarine was assigned to NUSC on 23 April 1971. It is also likely that a similar task for ULMS will be assigned to NURDC by PM-2 in the near future.)

E. Assign at least one Principal Development Agency (PDA) responsibility to each appropriate laboratory. (1 Dec 1972)

F. Provide for direct scientific and technical assistance to operational commands. (This will also strengthen and contribute to the laboratories' abilities in the area of warfare analysis by increasing their direct contact with Fleet problems.)

Vietnamese Laboratory Assistance Program (18 Nov 66)

Science Advisor to COMNAVFORV (1 Feb 68)

Science Advisor to COMNAVFORK (1 Feb 70)

Science Advisor to ASWFORMED (1 May 70)

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Science Advisor to SIXTHFLT

(1 Jun 71)

Others as requested in future.

EPILOGUE

While it may appear that these problems are secondary to the ones so often reported by the laboratories, e.g.: the marginal employee, being treated as "job shops", and being over-managed, they are, in fact, the crucial ones in terms of building the kind of Laboratories and Centers that the Navy needs. Competent laboratory management can deal with most of the routine problems but does need increased flexibility to pursue new ideas and concepts. Exposure to the Fleet will insure the relevance of the ideas and concepts. Additional funds under direct control of the laboratories will allow the testing of concepts with real hardware before the project or program becomes institutionalized in the RDT&E planning and budgeting world.

It is expected that this basic plan will be modified and enhanced during the next few years as new opportunities to achieve these and related goals appear. In the last five years considerable progress has been made toward establishing real "Centers of Excellence". The framework is there, and has begun to gain general acceptance. The next five years should see the development of an even more outstanding and widely recognized R&D community dedicated to the solution of the problems facing the Navy and the Nation in the Seventies.

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APPENDIX I

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Navy "In-House Laboratories"

In any review of "in-house laboratories" it is important to establish what the base being reviewed actually is. In the case of the Navy's in-house laboratories, the total complex ranges from 8 or 10 man groups which are really part of a Naval hospital through 80-100 man laboratories with a highly specialized function in direct support of a shipyard up to nearly 5000 people at the Naval Weapons Center at China Lake, California.

For the purpose of this review, evaluation and plan, the major emphasis has been placed on the nine major "hardware" laboratories under the command of the Chief of Naval Material, the Naval Research Laboratory under the command of the Chief of Naval Research, the Naval Medical Research Institute and a few other medical institutions under the command of the Chief of Medicine and Surgery and the two Personnel Research Laboratories under the command of the Chief of the Bureau of Personnel.

These are fundamentally the institutions to whom the Navy looks for "creative" efforts, and are included in the following list:

CNM:

Naval Air Development Center, Warminster, Pa.

Naval Civil Engineering Lab, Pt. Hueneme, Calif.

Naval Electronics Laboratory Center, San Diego, Calif.

Naval Ordnance Laboratory, White Oak, Md.

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Naval Ship Research & Development Center, Carderock, Md.

Naval Undersea Research & Development Center, San Diego, Calif.

Naval Underwater Systems Center, Newport, R.I.

Naval Weapons Center, China Lake, Calif.

Naval Weapons Laboratory, Dahlgren, Va.

CNR:

Naval Research Laboratory, Washington, D.C.

CBMS:

Naval Aerospace Medical Institute, Pensacola, Fla.

Naval Blood Research Laboratory, Chelsea, Mass.

Naval Medical Research Institute, Bethesda, Md.

Naval Neuropsychiatric Research Unit, San Diego, Calif.

Naval Submarine Medical Center, New London, Conn.

CBP:

Naval Personnel Research & Development Laboratory, Wash. D.C.

Naval Personnel & Training Research Laboratory, San Diego, Calif.

There are, of course, other "laboratories", in the sense of organizations doing highly technical work, within the Navy Department, such as the Naval Air Test Center at Patuxent River, Md., and the Naval Missile Center at Port Hueneme, California. However, these organizations are more concerned with the test and evaluation aspects of the RDT&E process and have been excluded from this study. Many of the recommendations and comments apply equally to these organizations, and it is planned to implement such actions as may be appropriate for them also.

APPENDIX II

Review and Evaluation of Navy In-House Laboratories

In order to plan meaningfully for the improvement of the Navy's In-House Laboratories, we must have a clear understanding of why the Navy wants them, what they must do to assist the Navy and how they are supposed to do it, and how well they are performing. Only after this has been established can we seek for the causes of poor performance and the means of correcting any observed deficiencies.

Following this procedure, the summary below sets forth a distillation of many discussions with senior Navy officials concerned with RDT&E, including program managers, project managers, Fleet personnel, laboratory personnel both in management and at the working level, and policy officials.

I. Objectives

The Navy Department's Objectives in maintaining its In-House Laboratories are:

A. We wish to assure that we have the best, most up-to-date, capable and effective Naval & Marine Forces which modern technology can provide, within cost constraints imposed by higher authority.

B. We wish to maintain a sufficient base of scientific and engineering talent, experienced in Naval and Marine Corps matters and problems as to preclude the possibility of "technological surprise" due to unforeseen applications of new technologies by potential enemies.

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C. We wish to enter the marketplace in the acquisition of new weapons and weapon systems as sophisticated buyers, with technical experience and expertise in the disciplines relevant to the development of such systems.

D. We wish to maintain a technical memory of problems and solutions to assist with support of deployed equipment and its improvement while in service, as well as to guide new acquisition decisions.

E. We wish to have continuously available the capability to exploit new technical opportunities on a quick reaction basis, often under tight security controls, for the solution of Naval and Marine Corps problems.

II. Roles of the Laboratories

The Laboratories and Centers assist the Navy Department in obtaining these objectives by:

A. Carrying out a program of warfare analysis, comprising intelligence studies, operations research, systems analysis, evaluation of fleet exercise results and operational reports, and participation in fleet exercises, to gain an understanding of the operational problems and opportunities facing the Fleet and the Marine Corps.

B. Constantly seeking new applications of science and technology to Naval problems, and pushing forward the state of the art in those branches of science and technology of unique or particular importance to the Navy or Marine Corps.

C. Developing new weapon systems concepts to enhance the effectiveness of the Navy & Marine Corps operating forces, proving the

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feasibility of critical components, and building demonstration prototypes of such systems.

D. Acting as project manager, or as deputy project manager providing technical direction, in the engineering development phase of the acquisition process for new systems.

E. Acting as technical advisors and consultants to CNO, CMC, CNM, the other Bureaus, and the operating forces on matters within their areas of speciality.

F. Providing the technical knowledge, skills, and facilities required to modify and make product improvements to the equipment in use by the Fleet and the Marine Corps.

III. Mission Areas Assigned to Laboratories:

Because of the diversity of technical and sophisticated equipment required and used by the Navy in carrying out its assigned missions, the Navy's in-house (hardware) laboratories have been oriented or "missionized" in several ways in somewhat of a "matrix organization":

A. NADC and NSRDC are platform oriented and concerned with the materials, structures, fluid dynamics, and control problems of their respective platforms. In addition, they are involved in the mission analysis and systems integration for these platforms.

B. NWL and NWC are focussed on surface warfare or weapons and air warfare or air launched weapons respectively.

C. NUSC and NURDC are focussed on the broad area of undersea and/or anti-submarine warfare.

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D. NELC and NOL are oriented along technology lines; NELC focussed on electronics with a strong bias toward information processing and display techniques and communications, NOL is focussed on ordnance technology with a bias toward Naval mines and torpedoes.

E. NCEL directs its efforts across the whole field of civil engineering from basic scientific investigations of materials, through construction techniques to analysis of engineering support requirements for amphibious operations, with a special emphasis on underwater construction technology.

F. NRL provides basic and applied research support across essentially all disciplines of interest to the Navy, with particular emphasis on the propagation and detection of underwater sound, electronic warfare, and space systems to support Naval missions.

G. The medical and behavioral sciences components of the Navy's in-house laboratories are oriented toward solution of "people" problems peculiar to, or of significant concern to, the Navy. They are concerned with the effects of stress upon man's performance such as that induced by diving, flying, confinement or prolonged isolation in unnatural surroundings, or exhaustive performance. They are concerned with the identification and treatment of exotic diseases indigenous to any part of the globe and with trauma of all sorts. In addition, and of particular importance, is their concern with motivation and the maintenance of morale, prevention of psychiatric disabilities, and improvement in training methods.

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IV. Evaluation of the Laboratories Present Performance

Evaluating how effectively the Laboratories and Centers are fulfilling their roles and being used by the Navy, to assist the Navy in achieving its objectives, must of necessity be a fairly subjective task. However, one can measure their performance against the roles they are expected to play, and arrive at some general observations or conclusions:

A. In general, they are carrying out a barely adequate program of warfare analysis. Their overall activity needs to be increased, particularly in the areas of intelligence studies and interaction with the intelligence community, and of participation in the planning, conduct and evaluation of fleet exercises. Somewhat more emphasis on operations research would strengthen their base for systems analysis and concept formulation.

B. In the application of new technologies to Navy problems, and in advancing the state of the art in the relevant technologies, the Laboratories are doing an outstanding job. Although they have not in the past given much consideration to the problems of the Marine Corps, this situation has recently been identified and it seems to be improving rapidly.

C. The Laboratories have been fairly effective and farsighted in developing new weapons system concepts, less so in the testing of critical components and the production of demonstration prototypes. This is often the result of alleged funding and/or time constraints, although other more subtle forces are also at work as will be discussed later.

D. With a few notable exceptions, the Laboratories have not assumed or been assigned major roles in the management of advanced and engineering development programs. Consideration must be given to assigning them more

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responsibility and authority in carrying out this role. Without it, the challenge that motivates and stimulates good technical performance is lacking, with the obvious results on the Laboratories' abilities to attract and retain outstanding technical people.

E. In their roles as technical advisors and consultants the Laboratories have performed and are performing admirably within the limits of their expertise and experience. More effort on building operating models of hardware would strengthen their ability to base advice on experience.

F. In their direct support to the operating forces of the Fleet, the Laboratories are doing an adequate job in those areas where they have had an historic mission. However, they are perhaps not as imaginative in seeking out new areas where they could help as they might be. Their direct assistance to the Marine Corps is essentially non-existent.

If the foregoing evaluation seems rather negative, it should be remembered that the major laboratories operate under the Naval Industrial Fund and do work only when it is ordered and paid for by an outside program or project manager. There is no direct appropriation of money to support the hardware Laboratories or pay salaries. Their "income" depends on their ability to sell their ideas and services to program & project managers in headquarters who are responsible for the execution of funded programs. Or, in the case of new ideas and developments, the laboratories must present a good enough case for their concept to persuade the appropriate elements of the Naval Material Command or the OPNAV staff to sponsor

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the introduction of their project into the Navy's RDT&E budget. The only exception to this is the Independent Research and Independent Exploratory Development programs, which funds are given directly to the Laboratory Technical Directors to manage as they see fit, with a post-audit of their use of them at the end of the year. These funds however, constitute only about 3.5% of the cash flow through the Laboratories.

Thus the pragmatic evaluation of the Laboratories and Centers in the market place, by customers responsible for managing project funds, seems to be favorable, as their workload and the demand for their services is continuously rising. So the preceding evaluation should be interpreted as applying to the whole Navy structure, as well as to the Laboratories. They can only work on things which someone will pay for, although they should perhaps exert more efforts to persuade people to pay for the "right" things.

V. Hinderances to Good Performance:

Again, in broad terms, when we seek reasons for this less than outstanding performance, we find them in the Laboratories' past histories, in the organizational environment within which they function, in the funding and budgeting procedures which we use, and in the sociologies of both the civil service and the professional scientific and engineering communities.

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Most of the laboratories got their start as technical job shops or test stations during World War II. Many of them rapidly developed a development capability to fix the deficiencies which they found, and to build new systems. The Navy at that time had a lot of technical strength in its headquarters and the Laboratories' major role was in carrying out tasks assigned by headquarters. This partially explains their present weakness in warfare analysis. It historically was not their business to ask such questions, or to propose answers.

In addition, the birth-to-death philosophy which was prevalent under the old Bureau system still lingers on. The total responsibility for a "system" from the research through development, acquisition and logistic support throughout its life, including all the product improvements and modifications, is assigned to the Systems Commands. This philosophy, coupled with the memory of a once strong technical capability in headquarters makes it difficult for the development oriented people in the laboratories to exert as much influence as they perhaps should. A new concept is too often seen as a competitor to an ongoing, "established", program by their potential Headquarters sponsors.

Coupled with this is a real pressure on the direction and control of R&D funds which arises out of the logistics and acquisition roles of the Systems Commands. There is a constant pressure to "steal" R&D money to "bail out" an ongoing development or provide fixes for in-service equipment.

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As weapon systems have become larger, more complex, and more costly, the effort required to manage the production engineering, acquisition, and logistic support has mushroomed. This has resulted in an overshadowing of the complete development of concepts by means of working models or demonstration prototypes. All too often the prototype is skipped, or else made into the first militarized model in an effort to "speedup" the whole process.

It would appear that the Navy could improve its utilization of its in-house technical talent if these pressures could be reduced. If the RDT&E process up through what we now call 6.3 (Advanced Development) can be made more flexible, and greater emphasis is placed on doing a wide range of technical "homework" with less attention to documenting life cycle costs and logistic support, then it should be possible to make choices between competing systems based on their performance - and to develop the trade-offs in terms of costs, support, etc. after we were more sure of what the system could or should do. It is the belief of many people in the R&D community that much more of this sort of work could be accomplished within the funds presently available if we reduced the requirements for "planning" and made more use of the "junk piles" in the laboratories to produce less "finished" products. For instance, a USQ-20B computer might provide an adequate simulation in a working model of a fire control system, even

though it was perfectly clear that if the system were put into production one would want to specify an AN/UYK-7, or a light weight airborne equipment, depending on the system under discussion.

This would lead to a sounder and shorter Engineering development phase, and cheaper projects in 6.3. This in turn would make it possible to carry out more projects in 6.3 and to select one of several ideas to carry into 6.4, rather than making that choice at the entry to 6.3 as is now done.

VI. Recommendations to Improve the Performance of the In-House Laboratories

The important things which need to be done to both improve the Navy's Laboratories and Centers, and the Navy's utilization of this pool of talent are:

- A. Increase their contact and interaction with the intelligence community.
- B. Increase their participation in the planning, conduct, and evaluation of fleet exercises as military operations rather than technical tests of a particular piece of equipment.
- C. Give them more responsibility for major programs, perhaps project managership of one or two programs at each lab.
- D. Make it possible, by "de-formalizing" the controls over 6.3, for them to explore more concepts experimentally. Besides providing a

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wider choice of solutions to military problems, this will produce a more experienced and better qualified cadre of "advisors" for Project Managers and Source Selection Boards to draw on.

VII. Present Status of Program

The Navy has made, and is continuing to make, real efforts in the first three areas. Some specific examples of these efforts are:

A. Scientific and Technical Liaison Officers were established at the Laboratories and Centers a year ago, and are now in close touch with people at STIC. Recently, there has been an expression of interest in some form of Liaison by NSA and the Naval Security Group.

B. Laboratory personnel have, in the last six months, been active in the ASWFORPAC "UPTIDE" exercises in a very meaningful way. NELC is deeply involved in studies of the traffic flow and reasons for it during the Mediterranean crisis. Laboratory personnel have been on the scene throughout areas of Navy/Marine Corps responsibility in Vietnam under the VLAP program since 1967.

C. In the Standard ARM program, China Lake was Deputy Project Manager, resulting in weapons fired in combat 14 months after DDR&E approved the program. NSRDC has been technical director of the Navy's hydrofoil program for more than eight years. More recently, the entire Project Managership of CAPTOR through its early phases, has been assigned to NOL.

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There is not as much "good news" in the fourth area. It is too easy to respond, "But DDR&E requires the TDP, or planning document, or whatever." The Navy cannot overcome the bureaucratic inertia without outside assistance and encouragement. This is a major change, really, in DOD philosophy - although Mr. Packard may think that's what's going on now - and needs to be verbalized by SECDEF, and reflected in the day-to-day actions of his people - particularly DDR&E.

All the other proposals such as increased flexibility in hiring and firing of personnel are really secondary. At least in the Navy R&D community, the Laboratory/Center Technical Directors are real professionals and can deal with such minor inconveniences effectively. The DNL can and has taken steps to implement the first two needs. ASN(R&D), CNO, CNM, and the Systems Commanders are making progress with the third. But the philosophical problem presented by the last "need" requires the understanding and active assistance of DOD/OSD/DDR&E.

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